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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/062,873	01/31/2002	Jung-Hyun Kim	8021-86 (SS-15408-US)	2204

7590 08/13/2004

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EXAMINER	
CHEN, ALAN S	
ART UNIT	**PAPER NUMBER**
2182	

DATE MAILED: 08/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/062,873	KIM, JUNG-HYUN	
	Examiner	Art Unit	
	Alan S Chen	2182	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 June 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *6-14* is/are allowed.

6)☒ Claim(s) *1 and 3-5* is/are rejected.

7)☒ Claim(s) *2* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

FRITZ FLEMING
PRIMARY EXAMINER
GROUP 2100

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 January 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED FINAL ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1 and 3-5 are rejected under 35 USC 103(a) as being unpatentable over Christiansen in view of applicants admitted prior art.

3. As per claim 1, Christiansen discloses a communication system (Fig. 1 and 4) which stores packet data received via a plurality of channels (Fig. 1, element 20) in a memory (Fig. 1, element 90) or transmits packet data stored in a memory through the plurality of communication channels, the communication system comprising: a plurality of buffer descriptors in which information on packet data received or transmitted via the plurality of communication channels is stored (Column 1, lines 24-32); a DMA controller which inherently can have a processing unit which stores the information on packet data in each of the plurality of buffer descriptors (Column 1, lines 40-52), and allots a flag bit (Fig. 7 and 8) to each buffer descriptor indicating whether an error occurred in packet data received via the plurality of communication channels, or whether the processing of each of the buffer descriptors is completed (Fig. 7 and 9); and a DMA controller which determines the flag bit allotted by the CPU, and according to the flag bit, stops processing a buffer descriptor currently being accessed and accesses the next buffer descriptor, or processes packet data according to information stored in buffer descriptor currently being accessed (Column 4, lines 1-12).

Christiansen does not disclose expressly the *central* processing unit storing the information pertaining to packet data in the buffer descriptors nor allotting a flag bit indicating the error/completion of a transfer.

Applicants admitted prior art discloses the CPU being in charge of storing and allotting bits pertaining to the buffer descriptors (page two of specification and Fig. 1 of drawings).

Christiansen and the applicant's prior art analogous art because they are from the same field of endeavor in implementing DMA controllers and processing of the associated buffer descriptors.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to have the CPU be in char go storing and allotting bits pertaining to the buffer descriptor.

The suggestion/motivation for doing so would have been to delegate specialized tasks, e.g., having a CPU mode and a DMA mode, such that modules that can handle a particular task best is delegated with that task. Hence, the CPU having the more powerful execution unit, deals with manipulation of the buffer descriptors while the DMA controller having simpler logic, deals with the handling of buffer descriptors.

Therefore, it would have been obvious to combine Christiansen with applicants admitted prior art for the benefit of delegation of buffer descriptor tasks to improve overall system performance.

4. As per claims 3-5, Christiansen combined with applicants admitted prior art discloses the communication system of claim 1.

Christiansen does not disclose expressly a NBDP allotted by the CPU to each of the buffer descriptors and the DMA controller accessing the NBD based on an identification of the NBDP allotted to the buffer descriptor currently being accessed. Christiansen also does not disclose expressly processing of the buffer descriptor sequentially by adding to the start pointer the size of the previous buffer descriptor, in essence, having an address counter.

The admitted prior art by the applicant (Fig. 1 and 2) discloses the above-mentioned function of the NBDP (Fig. 1) as well as the sequential processing of the buffer descriptors (Fig. 2).

Christiansen and the applicant's prior art analogous art because they are from the same field of endeavor in implementing DMA controllers and processing of the associated buffer descriptors.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to include the NBDP and sequential processing of buffer descriptors.

The suggestion/motivation for doing so would have been to allow the next buffer descriptor to be stored elsewhere that is not immediately adjacent to the buffer descriptor currently being processed as well as processing buffer descriptors that are adjacent to each other. A plethora of current memory access methods allow for both contiguous and noncontiguous memory processing.

Therefore, it would have been obvious to combine Christiansen with the prior art admitted by the applicant for the benefit of buffer descriptors processed with contiguous and noncontiguous memory.

Response to Arguments

5. Applicant's arguments filed 06/03/2004 have been fully considered but they are not persuasive. Examiners reasons are given below.

Rejections under 35 U.S.C. 102(b)

Claims 1 and 3-5

6. Applicant argues Christiansen does not teach that, according to the flag bit, a DMA stops processing a buffer descriptor currently being accessed and accesses a next buffer descriptor, essentially as claimed in claim 1. Nowhere does Christiansen teach or suggest that a DMA stops a current process and begins a next process. Christiansen teaches that a transmission of a data packet continues until complete. In addition, applicant argues combining with the cited applicants prior art does not render the limitation of stopping the processing of the buffer descriptor currently being accessed and accessing the next buffer descriptor.

7. The Examiner does not concede to this argument, but wishes to point out that claim 1 recites: "...stops processing a buffer descriptor currently being accessed and accesses the next buffer descriptor, or processes packet data according to information stored in buffer descriptor currently being accessed." This limitation is a conditional statement, requiring only either to stop processing a buffer descriptor *or* process packet data according to information stored in the buffer descriptor currently being accessed. As long as the former or the latter is recited in Christiansen, in addition to the rest of claim 1, then the 103(a) rejection should be deemed appropriate. It is clear that Christiansen indeed uses a DMA controller that has a flag bit wherein the DMA controller to process packet data according to the information stored in the buffer descriptor currently being

accessed. As indicated in Fig. 3, the channel status register, part of the buffer descriptor (as described in Column 1, lines 25-32), has status bits indicating to the controller (Fig. 1, element 10) how to process packet data, e.g., run, pause, flush, etc. Further disclosure as can be cited in Column 4, lines 1-20.

Allowable Subject Matter

8. Claims 6-14 are allowed.

9. Claim 2 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan S Chen whose telephone number is 703-605-0708. The examiner can normally be reached on M-F 8:30am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey A Gaffin can be reached on 703-308-3301. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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ASC
08/06/2004